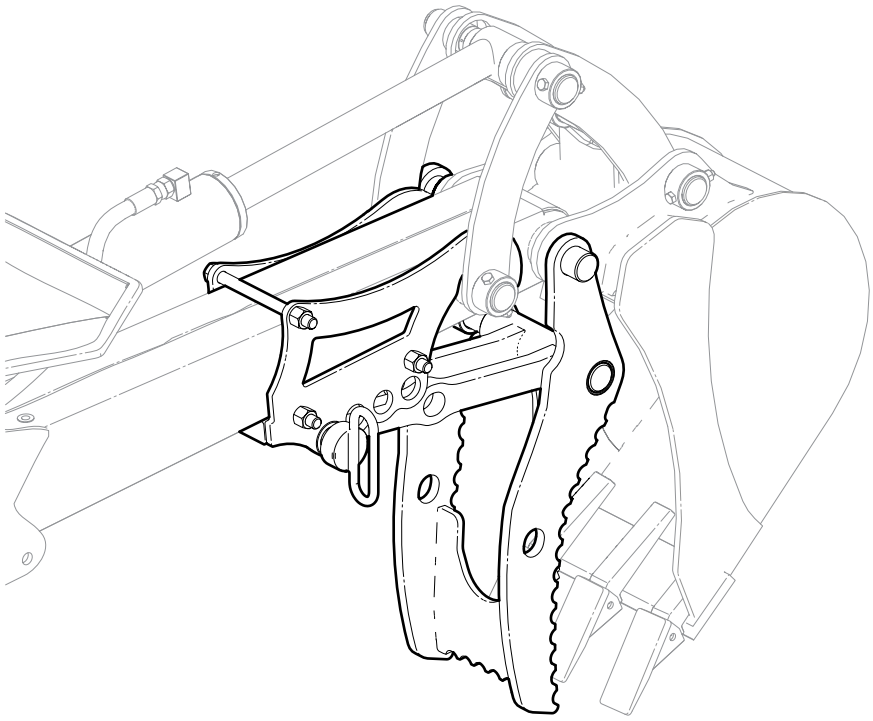
INSTALLATION INSTRUCTIONS

BT Series
Mechanical Thumb



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WALLENSTEIN

Foreword

Introduction

Congratulations on your choice of a Wallenstein Mechanical Thumb. Each mechanical thumb is designed for installation on a specific Wallenstein backhoe or skid digger.

This document covers the following Wallenstein mechanical thumbs:

Model	Backhoe or Skid Digger Model
BT5280	GE605, GX620
BT5290	GX720, GX920
BT5310	QC630
BT5330	GX920XT

Safe, efficient and trouble free use of this Wallenstein product requires that anyone using or maintaining the equipment reads and understands the safety information in this document.

Keep this document handy for reference and to pass on to new owners. If you need assistance, contact your local Wallenstein dealer.

Units of measurement in Wallenstein Equipment technical documents are written as: US Customary (SI metric).

⚠ WARNING!

Do not risk personal injury by working in an unsafe situation. Make sure that the work environment is safe and place the equipment in a safe condition for service and maintenance.

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Safety

Safety Alert Symbol

This Safety Alert Symbol means:

ATTENTION! BE ALERT!

YOUR SAFETY IS INVOLVED!

The **Safety Alert Symbol** identifies important safety messages on the Wallenstein product and in this instruction. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Signal Words

The signal words **DANGER**, **WARNING** and **CAUTION** determine the seriousness level of the warning messages in this manual. The appropriate signal word for each message in this manual has been selected using the following guidelines:

DANGER –

Indicates an imminently hazardous situation that, if not avoided, **will** result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be shielded.

WARNING –

Indicates a potentially hazardous situation that, if not avoided, **could** result in death or serious injury, and includes hazards that are exposed when shields are removed. It may also be used to alert against unsafe practices.

CAUTION –

Indicates a potentially hazardous situation that, if not avoided, **may** result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT – To avoid confusing equipment protection with personal safety messages, a signal word IMPORTANT indicates a situation that if not avoided, could result in damage to the machine.

☞ *Provides additional information that is helpful.*

Safe Condition

The term **Safe Condition** is referenced in this document. A safe condition means the equipment is in a state that makes it safe to work on.

Before starting any service or maintenance, complete the following:

Safe Condition
1. Turn off the hydraulic system.
2. Set the parking brake.
3. Turn off the engine.
4. Remove the ignition key.
5. Make sure that all motion is stopped.
6. Block or chock the wheels.

Mechanical Thumb Parts

BT5280 Parts

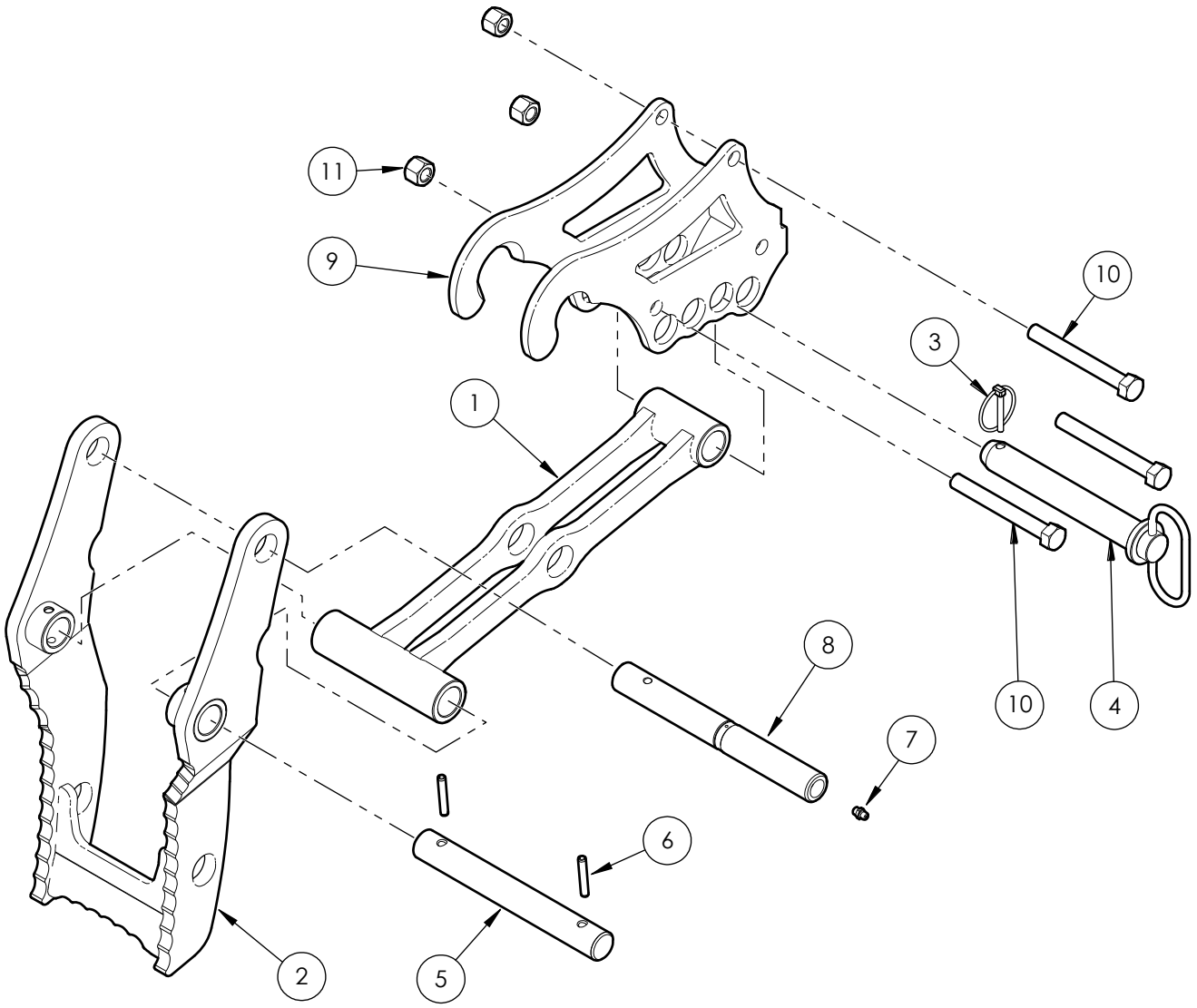

Fig. 1–BT5280 mechanical thumb parts

Item	Part Number	Description	Quantity
1	3083W062	Thumb-support link	1
2	3083W061	Thumb weldment	1
3	Z12110	Lynch pin 3/16"	1
4	Z11261	Hitch pin 1" x 6-1/4"	1
5	3083M063	Thumb brace pivot pin	1
6	Z14171	Roll pin, 1/4" x 1-1/2"	2

Item	Part Number	Description	Quantity
7	Z29202	Grease fitting 1/4" NF	1
8	3083M064	Extended bucket-thumb pin	1
9	3083W060	Lug weldment	1
10	Z71542	Hex bolt 1/2" NC x 4-1/4"	3
11	Z72251	Hex lock nut 1/2" NC	3

BT5290 Parts

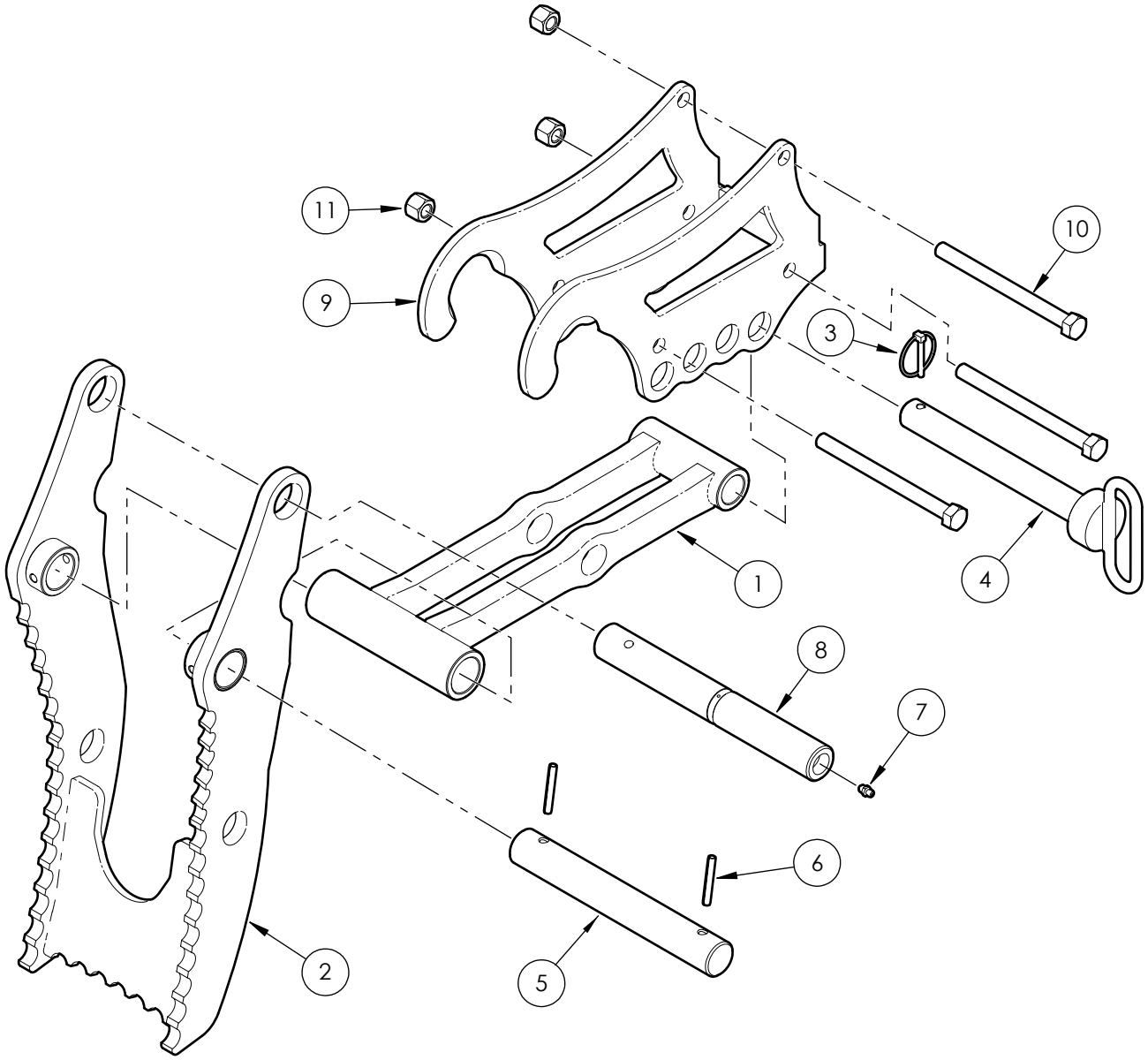

Fig. 2–BT5290 mechanical thumb parts

Item	Part Number	Description	Quantity
1	3083W072	Thumb-support link	1
2	3083W071	Thumb weldment	1
3	Z12110	Lynch pin 3/16	1
4	Z11263	Hitch pin 1" x 7-1/2"	1
5	3083M073	Thumb brace pivot pin	1
6	Z14172	Roll pin, 1/4" x 1-3/4"	2

Item	Part Number	Description	Quantity
7	Z29202	Grease fitting 1/4" NF	1
8	3083M074	Extended bucket-thumb pin	1
9	3083W070	Lug weldment	1
10	Z71560	Hex bolt 1/2" NC x 6"	3
11	Z72251	Hex lock nut 1/2" NC	3

BT5310 Parts

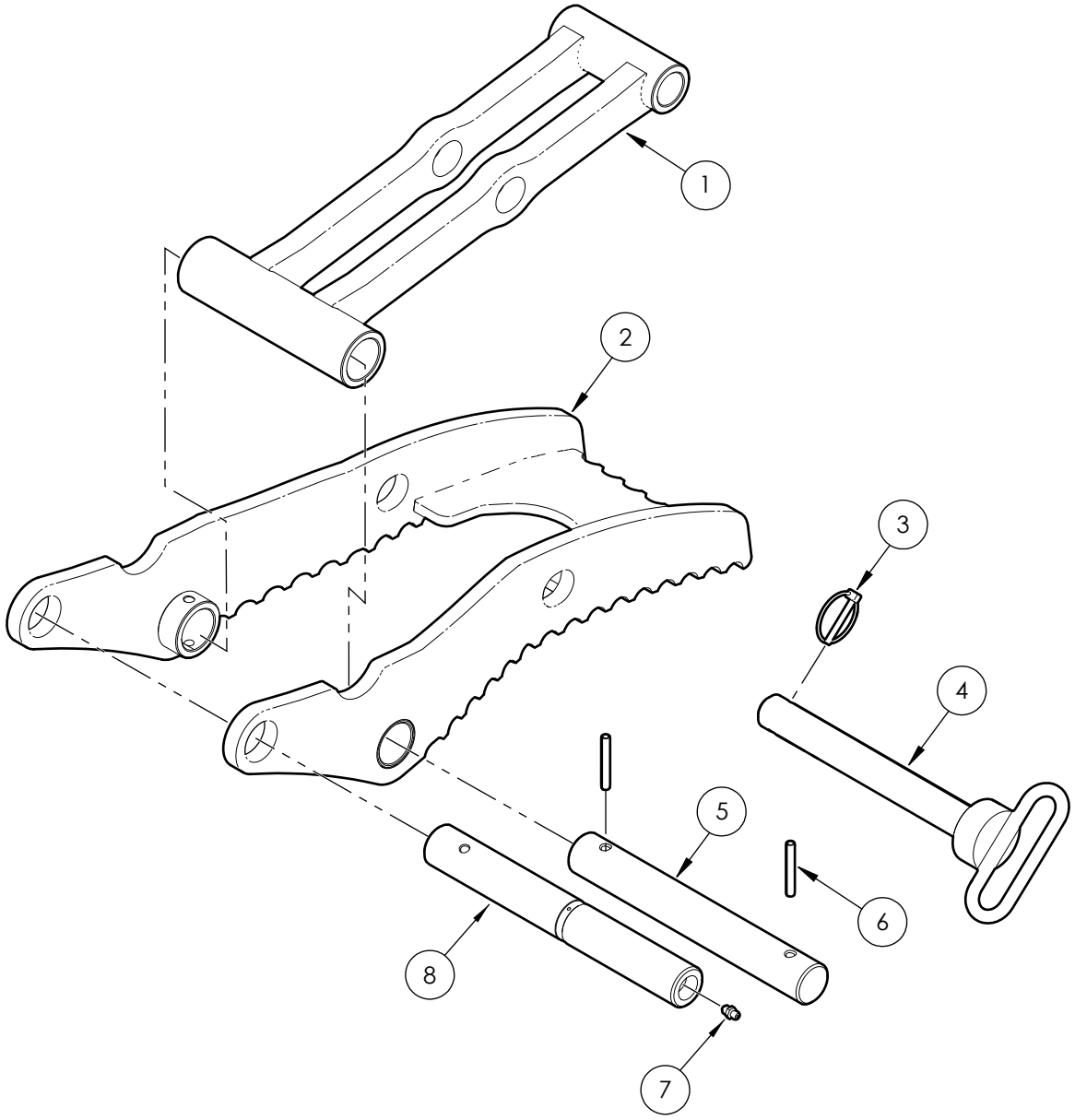

Fig. 3–BT5310 mechanical thumb parts

Item	Part Number	Description	Quantity
1	3083W072	Thumb-support link	1
2	3083W071	Thumb weldment	1
3	Z12110	Lynch pin 3/16"	1
4	Z11263	Hitch pin 1" x 7-1/2"	1

Item	Part Number	Description	Quantity
5	3083M073	Thumb brace pivot pin	1
6	Z14172	Roll pin, 1/4" x 1-3/4"	2
7	Z29202	Grease fitting 1/4" NF	1
8	3083M074	Extended bucket-thumb pin	1

BT5330 Parts

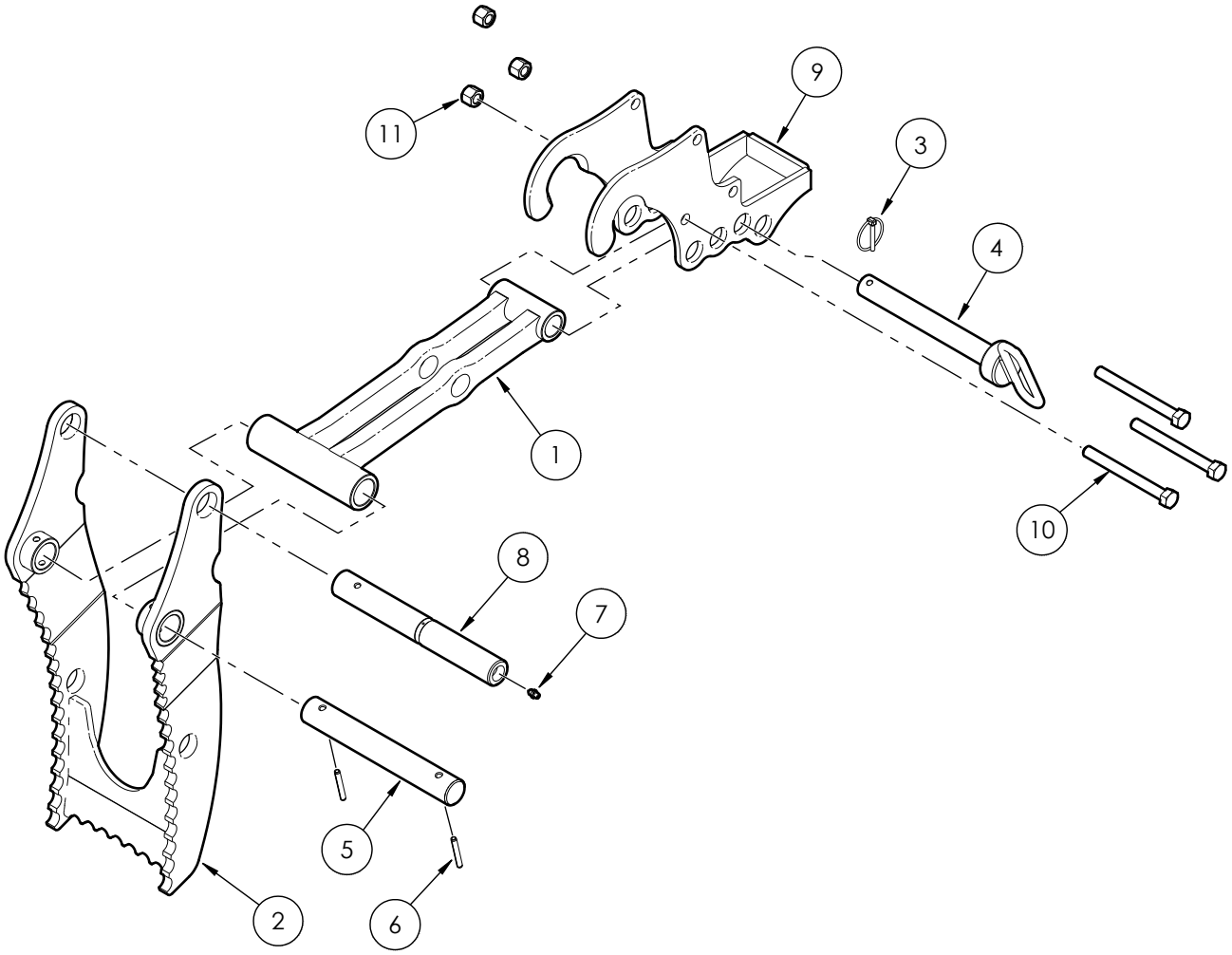

Fig. 4–BT5330 mechanical thumb parts

Item	Part Number	Description	Quantity
1	3083W122	Thumb-support link	1
2	3083W121	Thumb weldment	1
3	Z12110	Lynch pin 3/16"	1
4	Z11263	Hitch pin 1" x 7-1/2"	1
5	3083M073	Thumb brace pivot pin	1
6	Z14172	Roll pin, 1/4" x 1-3/4"	2

Item	Part Number	Description	Quantity
7	Z29202	Grease fitting 1/4" NF	1
8	3083M124	Extended bucket-thumb pin	1
9	3083W120	Lug weldment	1
10	Z71550	Hex bolt 1/2" NC x 5"	3
11	Z72251	Hex lock nut 1/2" NC	3

Installation

⚠ WARNING!

Use a lifting device with enough capacity to safely support the expected weight of the object being lifted. To prevent back injuries, use a hoist to lift objects that weigh 50 lb (23 kg) or more.

⚠ WARNING!

Never work under equipment unless it is securely supported with blocks. Do not depend on the hydraulic system to hold a machine or attachment in place.

⚠ WARNING!

Do not risk personal injury by working in an unsafe situation. Make sure that the work environment is safe and place the equipment in a safe condition for service and maintenance.

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IMPORTANT! BT Series mechanical thumbs are designed for small tractor or skid steer mounted backhoes that have a maximum bucket-digging force of 4,000 lb. Installation on a larger machine may damage the equipment and void the warranty.

Read and understand all of the installation instructions before you start.

Mechanical thumb item numbers are in brackets and defined under *Mechanical Thumb Parts on page 5*.

Required Tools and Grease

- Two 3/4" wrenches
- Two 7/16" or 3/8" wrenches
- One torque wrench with each of the following:
  - 3/4" socket
  - 7/16" or 3/8" socket
- SAE multi-purpose high temperature grease with extreme pressure (EP) performance or SAE multipurpose lithium-based grease.

Step 1 Prepare the Equipment

a. Park the tractor or skid steer on a dry, level surface.

b. Extend the backhoe, rotate the bucket, and then lower the bucket to the ground. Make sure that there is enough space to work under the boom.

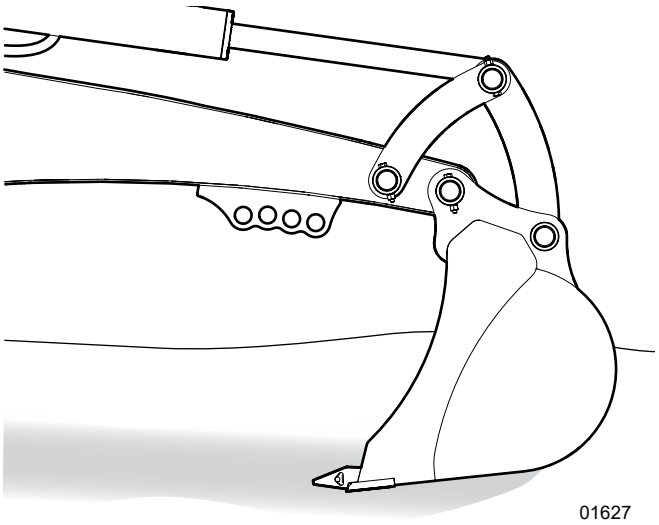


Fig. 5–Lower the bucket to the ground (QC620 skid digger shown)

c. Set the tractor or skid steer to a safe condition:

Safe Condition
1. Turn off the hydraulic system.
2. Set the parking brake.
3. Turn off the engine.
4. Remove the ignition key.
5. Make sure that all motion is stopped.
6. Block or chock the wheels.

d. Remove the following components from the mechanical thumb:

1. All models: lynch pin (3)
2. All models: hitch pin (4)
3. Models BT5280, BT5290, and BT5330: weldment lug (9)

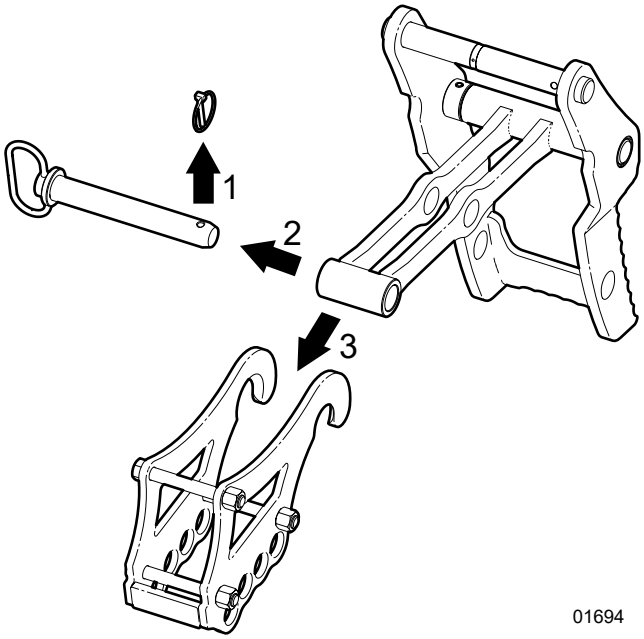


Fig. 6– Separate the mechanical thumb components (model BT5280 shown)

Reinsert the lynch pin in the hitch pin for safe keeping.

Step 2 Install the Lug Weldment

For model BT5310, go to *Step 3 Install the Thumb Weldment on page 11*.

For models BT5280, BT5290, and BT5330, install the lug weldment (9) on the boom:

a. Remove the top lock nut (11) and bolt (10) from the lug weldment (9) and loosen the two bottom lock nuts.

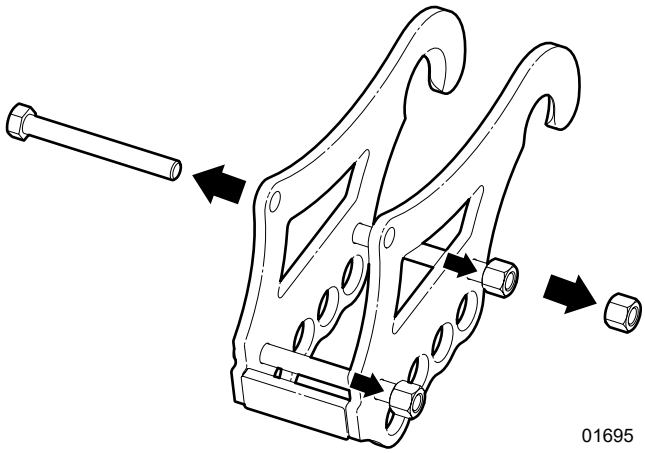


Fig. 7– Prepare the lug weldment (model BT5280 shown)

b. Install the lug weldment on the bottom of the boom.

Hook the front of the lug weldment over the rear bucket link, on each side of the boom.

If the lug weldment is too narrow, loosen the two bottom lock nuts. Do not force the lug weldment over the boom and cause damage to the equipment.

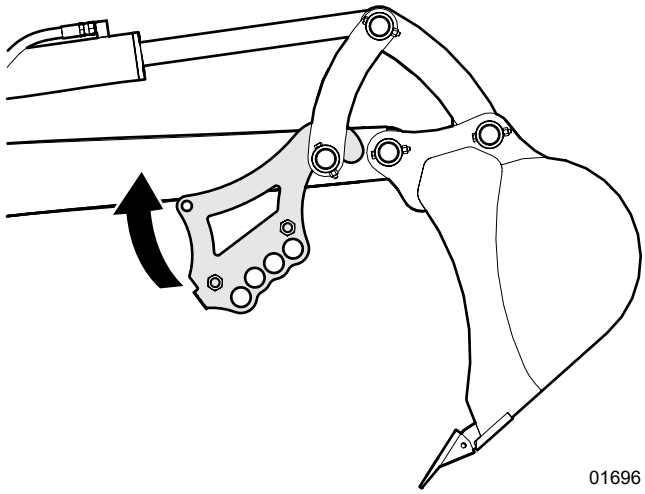


Fig. 8– Install the lug weldment

c. Tighten the two lock nuts, and then install the top bolt and lock nut.

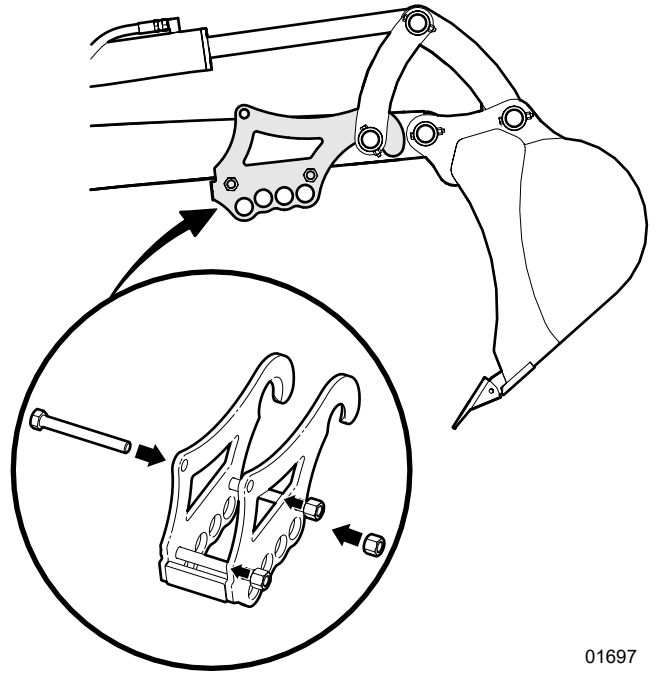


Fig. 9–Secure the lug weldment to the boom

d. Use a torque wrench to tighten the three lock nuts to **80 lbf•ft (110 N•m)**.

Make sure that the lug weldment is securely attached to the boom.

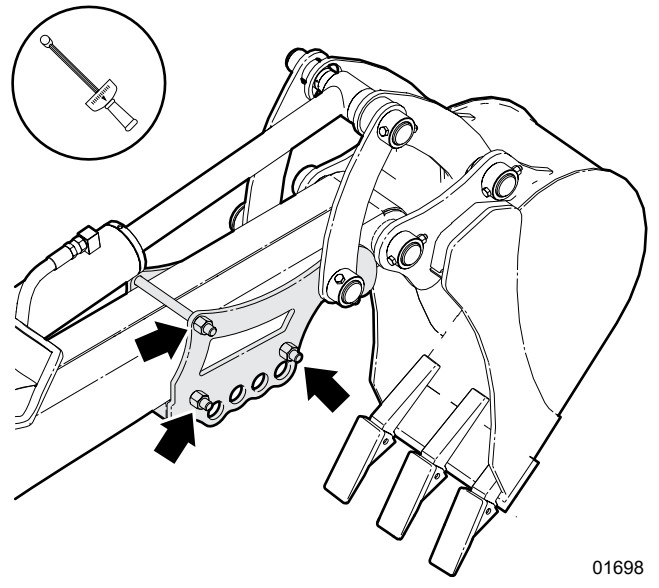


Fig. 10–Torque the three lock nuts

Step 3 Install the Thumb Weldment

IMPORTANT! Be careful when removing a pin. If a pin is hit too hard, the end could expand (mushroom) and become stuck.

a. Remove the 1/4" NC lock nut and retainer bolt from the pin that secures the bucket to the boom.

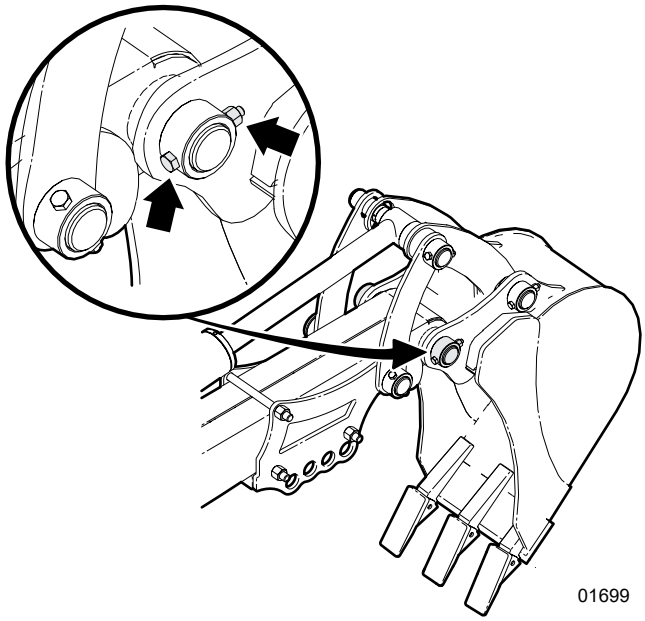


Fig. 11–Remove the retainer bolt and lock nut from the pin

b. Remove the pin from the bucket and boom.

Be careful not to damage the pin. If required, shift the boom or bucket to loosen it.

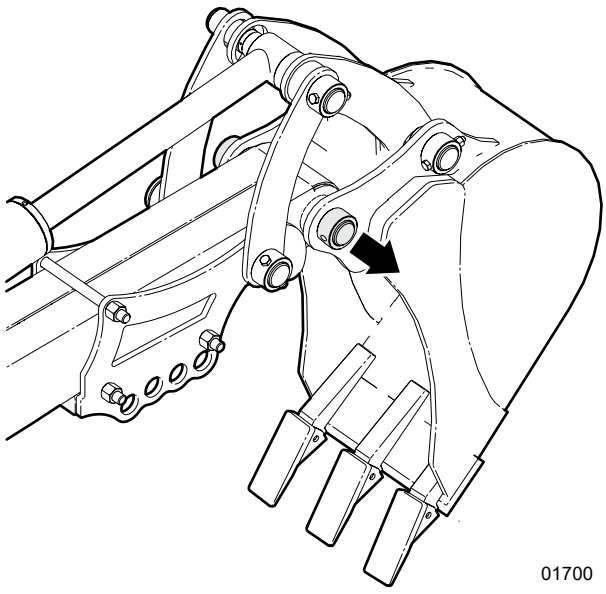


Fig. 12–Remove the pin that secures the bucket to the boom

c. Position the mechanical thumb below the end of the boom with the teeth facing the bucket.

Align the holes in the top of the thumb weldment (2) with the bucket and boom holes (where the pin was removed in step b).

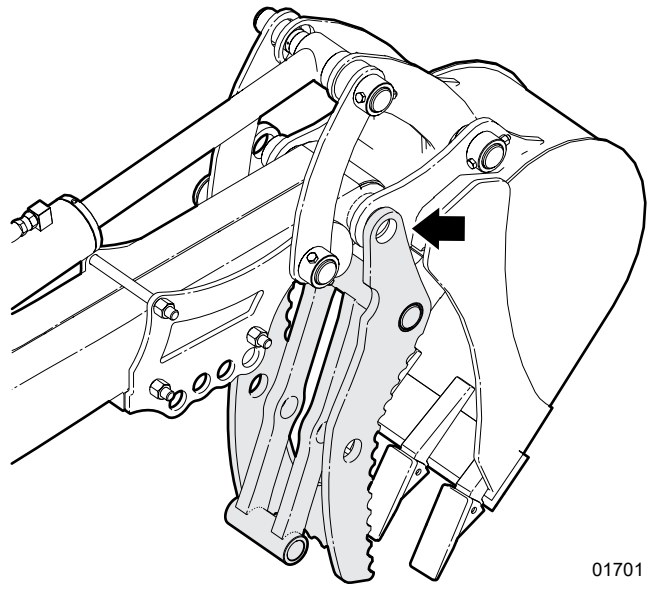


Fig. 13– Position the thumb weldment

d. Insert the extended bucket-thumb pin (8) through the holes in the thumb weldment, bucket, and boom.

Take care not to damage the pin. Adjust the boom or bucket, as required.

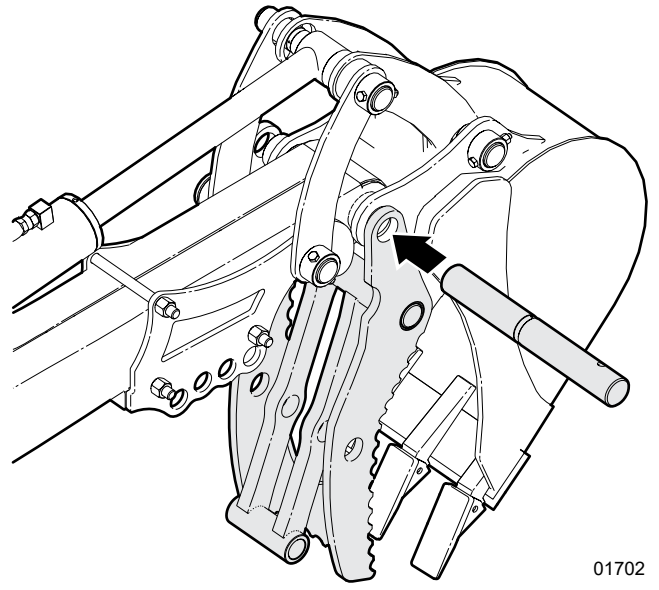


Fig. 14– Insert the extended bucket-thumb pin

e. Install the retainer bolt and lock nut (removed in step a) in the extended bucket-thumb pin.

The bolt hole is located between the mechanical thumb and the bucket.

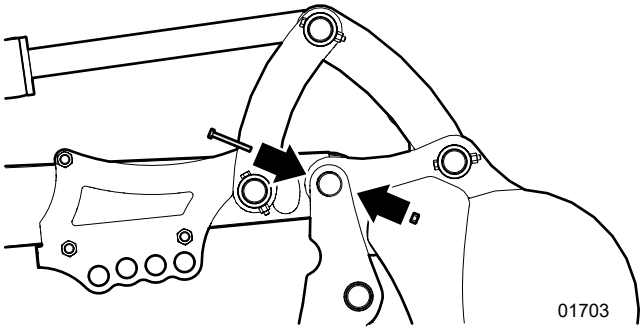


Fig. 15– .Secure the extended bucket-thumb pin

f. Use a torque wrench to tighten the lock nut to **9 lbf•ft (12 N•m).**

Make sure that the pin is securely installed.

g. Apply grease to the extended bucket-thumb pin grease fitting.

For information about the type of grease, see *Required Tools and Grease on page 9*.

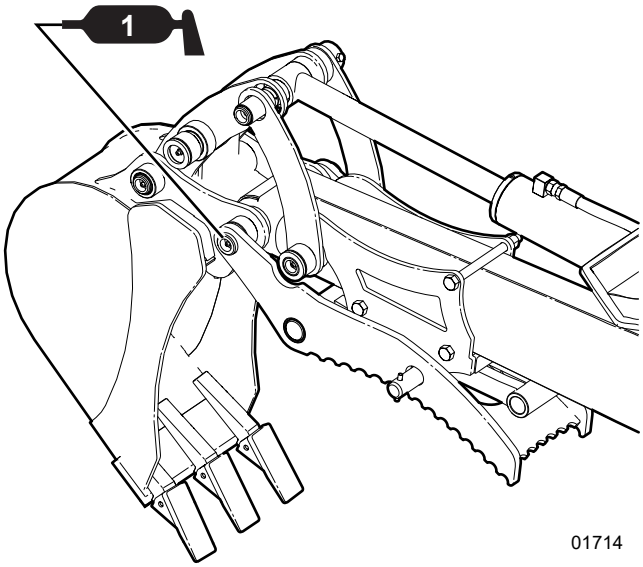


Fig. 16– Extended bucket-thumb pin grease fitting location

Step 4 Set the Mechanical Thumb Position

Set the mechanical thumb to a working position.

For instructions, see *Set a Mechanical Thumb Position on page 14*.

Step 5 Test the Installation

Slowly move the backhoe bucket and mechanical thumb through a full operating cycle. Watch the mechanical thumb and backhoe bucket to make sure they function correctly.

Set a Mechanical Thumb Position

Each mechanical thumb has five positions:

- One stowed position
- Four working positions

For reference, the following image shows the number assigned to each working position:

- Top: backhoe with lug weldment (model BT5280, BT5290, or BT5330)
- Bottom: skid digger mechanical-thumb bracket (model BT5310)

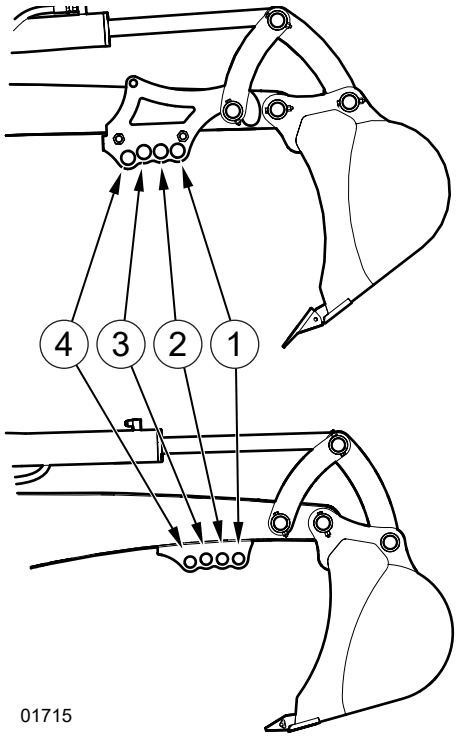


Fig. 17– Four working positions

Stowed Position

Mechanical thumb item numbers are in brackets and defined under *Mechanical Thumb Parts on page 5*.

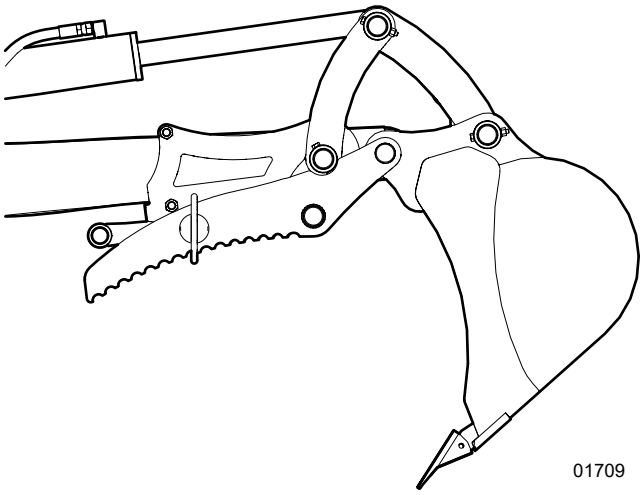


Fig. 18– Stowed position

a. Rotate the thumb-support link (1) and thumb weldment (2) up to the boom.

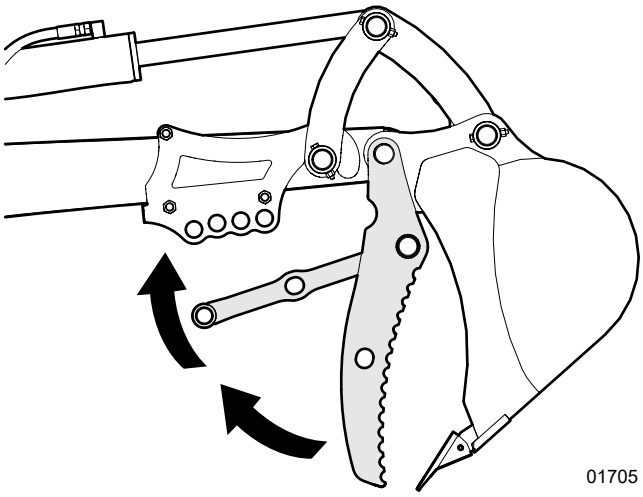


Fig. 19– Rotate the mechanical thumb up to the boom

b. Align the thumb-support link and thumb weldment center holes with working position four.

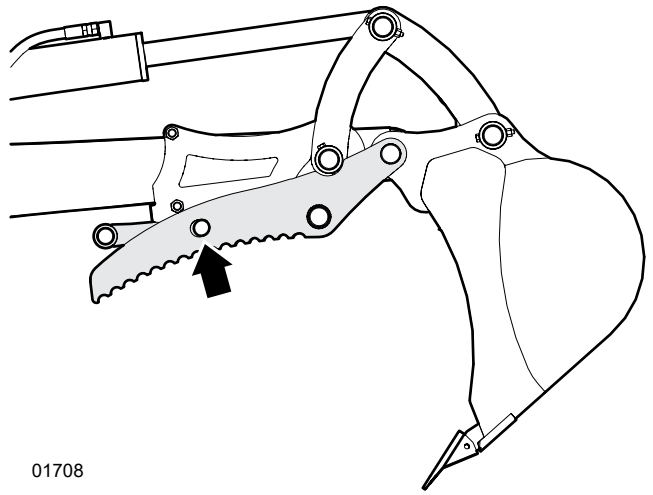


Fig. 20 – Lug weldment and mechanical-thumb bracket rear hole locations

c. Insert the hitch pin (4) through the following:

- Thumb weldment center hole
- Thumb-support link center hole
- Lug weldment or bracket

d. Install the lynch pin (3) through the hitch pin to secure the mechanical thumb in the stowed position.

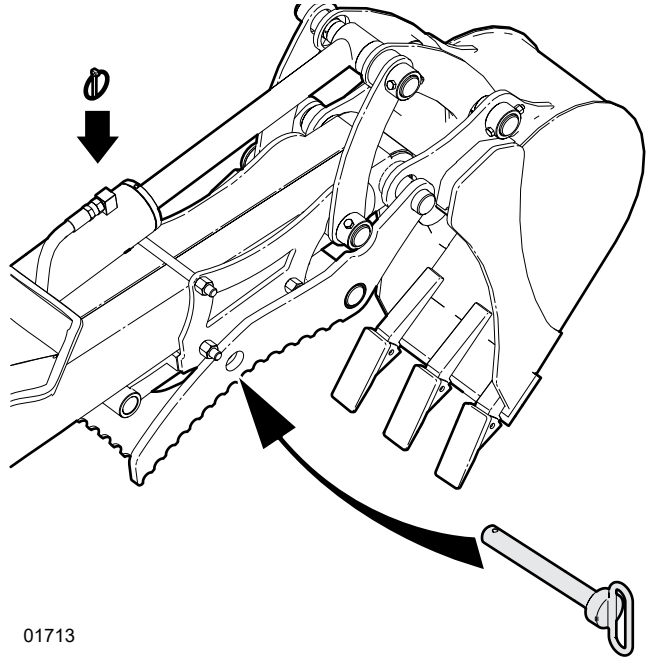


Fig. 21 – Secure the mechanical thumb in the stowed position

Working Position

Select a working position based on the type and size of material you are working with.

Mechanical thumb item numbers are in brackets and defined under *Mechanical Thumb Parts on page 5*.

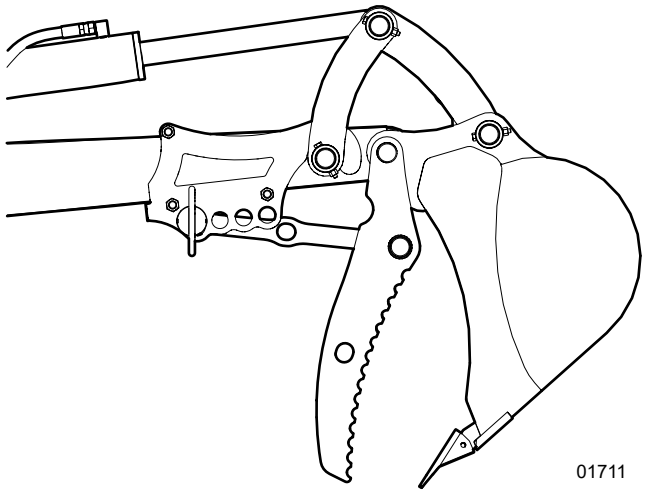


Fig. 22 – Working position four

a. Rotate the thumb-support link (1) up to the lug weldment or mechanical-thumb bracket on the boom.

b. Align the thumb-support link end tube with the required working position.

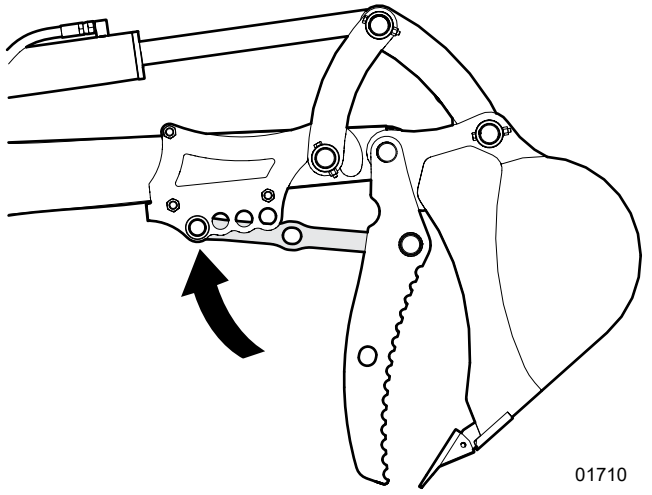


Fig. 23 – Rotate the thumb-support link to a working position (working position four shown)

c. Insert the hitch pin (4) through the lug weldment or bracket and thumb-support link end tube.

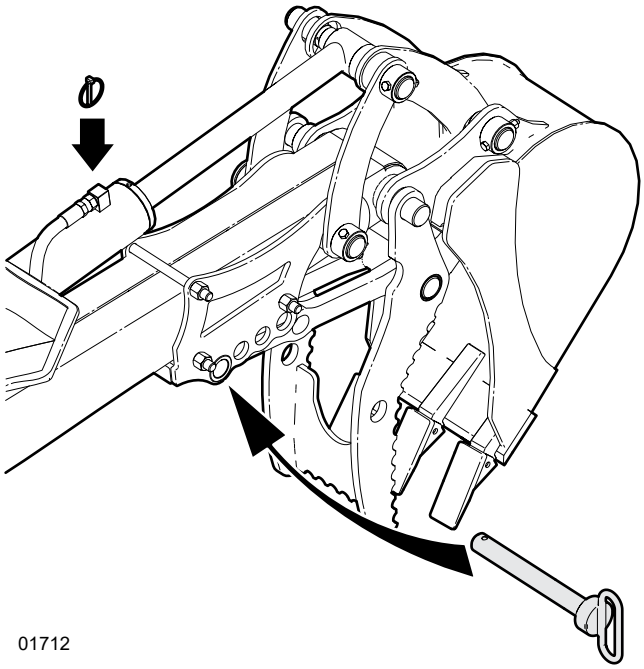


Fig. 24– Secure the mechanical thumb in a working position

d. Install the lynch pin (3) through the hitch pin to secure the mechanical thumb in the selected position.

Maintenance

The mechanical thumb becomes part of the backhoe and should be included with regular backhoe maintenance. For backhoe maintenance requirements, see the backhoe Operator's Manual.

If you need a copy of the backhoe Operator's Manual, go to www.wallensteinequipment.com or contact your local Wallenstein dealer or distributor.

Common Bolt Torque Values

Checking Bolt Torque

The tables shown give correct torque values for various bolts and capscrews. Tighten all bolts to the torque values specified in the table, unless indicated otherwise. Check tightness of bolts periodically.

IMPORTANT! If replacing hardware, use fasteners of the same grade.

IMPORTANT! Torque figures indicated in the table are for non-greased or non-oiled threads. Do not grease or oil threads unless indicated otherwise. When using a thread locker, increase torque values by 5%.

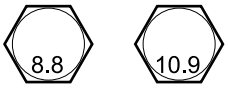
☞ *Bolt grades are identified by the bolt head markings.*

Imperial Bolt Torque Specifications

Bolt Diameter	Torque Value					
	SAE Gr. 2		SAE Gr. 5		SAE Gr. 8	
	lbf•ft	N•m	lbf•ft	N•m	lbf•ft	N•m
1/4"	6	8	9	12	12	17
5/16"	10	13	19	25	27	36
3/8"	20	27	33	45	45	63
7/16"	30	41	53	72	75	100
1/2"	45	61	80	110	115	155
9/16"	60	95	115	155	165	220
5/8"	95	128	160	215	220	305
3/4"	165	225	290	390	400	540
7/8"	170	230	420	570	650	880
1"	225	345	630	850	970	1320

Metric Bolt Torque Specifications

Bolt Diameter	Torque Value			
	Gr. 8.8		Gr. 10.9	
	lbf•ft	N•m	lbf•ft	N•m
M3	0.4	0.5	1.3	1.8
M4	2.2	3	3.3	4.5
M6	7	10	11	15
M8	18	25	26	35
M10	37	50	52	70
M12	66	90	92	125
M14	83	112	116	158
M16	166	225	229	310
M20	321	435	450	610
M30	1,103	1 495	1,550	2 100



Product Warranty

LIMITED WARRANTY

Wallenstein products are warranted to be free of defects in materials and workmanship under normal use and service, for a period of

Five Years for Consumer Use

Two Years for Commercial/Rental Use

from the date of purchase, when operated and maintained in accordance with the operating and maintenance instructions supplied with the unit. Warranty is limited to the repair of the product and/or replacement of parts.

This warranty is extended only to the original purchaser and is not transferable.

Repairs must be done by an authorized dealer. Products will be returned to the dealer at the customer's expense. Include the original purchase receipt with any claim.

This warranty does not cover the following:

1) Normal maintenance or adjustments
2) Normal replacement of wearable and service parts
3) Consequential damage, indirect damage, or loss of profits
4) Damages resulting from:
   - Misuse, negligence, accident, theft or fire
   - Use of improper or insufficient fuel, fluids or lubricants
   - Use of parts or aftermarket accessories other than genuine Wallenstein parts
   - Modifications, alteration, tampering or improper repair performed by parties other than an authorized dealer
   - Any device or accessories installed by parties other than an authorized dealer
5) Engines. Engines are covered by the manufacturer of the engine for the warranty period they specify. For the details of your engine warranty, see your engine owner's manual. Information about engine warranty and service is also available in the FAQ section at www.wallensteinequipment.com

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WALLENSTEIN

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